LOCKHEED MARTIN

System Integration for Optimal Sensor Performance

for the

Air Coupled Acoustics Sensors Workshop

Facilities

BUILDING 1

BUILDING 2/3

- *284,000 square feet*
- *20,000 square feet of Clean Rooms*
- *ATCF (AIRS Test & Calibration Facility)*
  - *IR Instruments Calibrated Radiometically to Better than 3%*
  - *Precision Spectral/Spatial Calibration*

Sonoelectronics Program

ISSUE

Inexpensive contact and influence mines can deny the US Navy access to littoral Waters.

•Optical Imagers are expensive & seriously degraded by turbidity
•Traditional Sonars lack the resolution to Identify mines & suffer from multipath reflections.
• 80% of the time visibility in coastal areas can be expected to be less than 1 meter
• MCM Operations require covert operation. Optical and Sonar based systems are readily detected by conventional means.

TECHNICAL SOLUTION

An acoustical camera can be made small and low power enough to be hand-held or incorporated into small MCM UUVs.

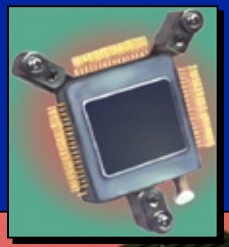
• 1 to 3 MHz operating frequency provides 1 cm resolution @ 4 m with no propagation beyond 100 m .
• MEMs approaches to high frequency transducers promise 10 to 100X improvements over current technology
• High Density Interconnects enable 16K element arrays
• Acoustical lenses provide parallel beamforming with no electrical power at low cost.

PLANS

Provide Technology Demonstration in 2001 With Diver Hand-Held Camera

• Three to Five MEMS Alternatives
• A Single Imaging System Supports all MEMS
• Three Stages of Capability Demonstrations Maintain The Application Focus
  ‘99 - 10 X 10 Capability baseline established
  ‘00 - 32 X 64 sub array functionality & progress demo
  ‘01 - 128 X 128 imaging system demonstrated

Integrated Sniper Location System I-SLS



PACKAGED
MICROBOLOMETER
FPA

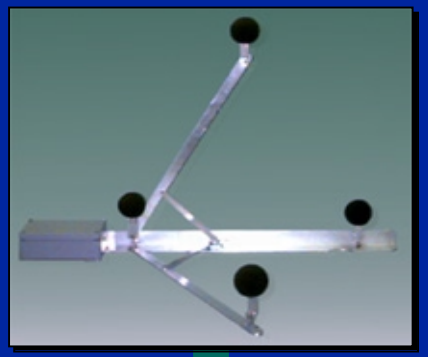
UNCOOLED
IR SENSOR

Digital
Video

IR SIGNAL
PROCESSOR

PAN/TILT
GIMBAL

ACOUSTIC
MICROPHONE
ARRAY



ACOUSTIC
SIGNAL
PROCESSOR

Lockheed Martin's I-SLS provides a low cost, high reliability means of detecting and locating hostile gunfire